Hong Kong’s Approach to COVID-19

CUGH Webinar
17 April 2020

Keiji Fukuda
Director, School of Public Health
The University of Hong Kong
Hong Kong

• Population: 7.5 million

• Visitors per year: 55.9 million in 2019
  ➢ Mainland China: 43 million
  ➢ Elsewhere: 12 million

• Economy
  ➢ International business, trade, financial hub, services, tourism
  ➢ Investment gateway between Mainland and World
Recent major events

• **1997: avian influenza H5N1**
  - 18 cases (6 deaths) HK
  - >1.5 million chickens slaughtered

• **2003: SARS**
  - 8,096 cases (774 deaths) worldwide
  - 1,755 cases (299 deaths) HK

• **2009: H1N1 swine flu**
  - 214 countries
  - >30,000 cases (80 deaths) in HK

• **2019: social unrest**
Legacy of SARS

Public
- Outbreaks viewed seriously
- Attentive to guidance
- Societal norms
  - Daily cleaning lift buttons... etc
  - Masks common
  - Double chopsticks

Government
- Highest level attention
- Structural
  - Centre for Health Protection
  - Health system
  - Academic EID programs
- Actions
  - Traveller quarantine in 2009
Epidemic curve of confirmed and probable cases of COVID-19 in Hong Kong (as of 13 Apr 2020)

Number of confirmed and probable cases = 1010

Source: Hong Kong Centre for Health Protection
**January 2020**

<table>
<thead>
<tr>
<th>Date</th>
<th>Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 Dec</td>
<td><strong>GOV vows vigilance after Wuhan reports infections</strong></td>
</tr>
<tr>
<td>4 Jan</td>
<td><strong>Preparedness and Response Plan launched: serious response level</strong></td>
</tr>
<tr>
<td>23 Jan</td>
<td><strong>2 infections confirmed</strong></td>
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<tr>
<td>24 Jan</td>
<td><strong>Health declaration required: all passengers at high-speed rail station</strong></td>
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<tr>
<td>25 Jan</td>
<td><strong>Response raised to highest emergency level</strong></td>
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<tr>
<td></td>
<td>• All Wuhan trains / flights stopped</td>
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<td></td>
<td>• All mainland checkpoints require health declaration; temperature screening at departures</td>
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<td></td>
<td>• School holiday extended</td>
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<tr>
<td>27 Jan</td>
<td><strong>Entry ban into HK for Hubei residents / travelers in previous 14 days</strong></td>
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<tr>
<td>28 Jan</td>
<td>• 6 border entry points suspended</td>
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<tr>
<td></td>
<td>• Mainland stops permits for visitors to Hong Kong</td>
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<tr>
<td></td>
<td>• Work-at-home arrangement for civil servants</td>
</tr>
</tbody>
</table>
## February 2020

### Mixed sources of infection
- Travelers
- Contacts
- Local

### Measures

<table>
<thead>
<tr>
<th>Date</th>
<th>Details</th>
</tr>
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</table>
| 4 Feb | • First local death  
      • Borders closed with China (except HK-Zhuhai-Macau Bridge, Shenzhen Bay Port, airport) |
| 8 Feb | • All people entering HK from Mainland placed in quarantine             |
March-April 2020

- Major surge
  - Returning residents
  - Contact
  - Local

### Measures

<table>
<thead>
<tr>
<th>Date</th>
<th>Actions</th>
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</thead>
<tbody>
<tr>
<td>23 Mar</td>
<td>- Ban on restaurants / bars selling alcohol</td>
</tr>
</tbody>
</table>
| 25 Mar | - No entry or transit for any incoming non-residents from overseas     
       | - All returning residents quarantined (home or hotel)                   |
| 28 Mar | Extend social-distancing laws                                           
       |   - A ban on public gatherings of more than 4 people                    
       |   - Closure of leisure venues, including cinemas, party rooms and gyms |
       |   - Restaurants and bars must half capacity / keep tables 1½ metres (5 feet) apart |
| 1-3 Apr| Closure of karaoke lounges, nightclubs, mahjong, pubs, bars             |
| 6 Apr  | Ban on entry of non-residents extended indefinitely                      |
| 8 Apr  | All incoming travelers into airport tested for coronavirus              |
| 10 Apr | Beauty and massage parlours closed                                     |
Basket of Measures (adjusted over time)

- Cross-government mobilization
- Public health
  - Surveillance
  - Case investigations & contact tracing
  - Isolation of cases
  - Quarantine of contacts
  - Testing
- Scientific community mobilized
- Communications
  - Press, website, videos ....

- Border & traveler restrictions
- Social distancing
  - Government, businesses, schools
  - Restaurants, bars, gyms ....etc
- Masks, handwashing .... etc
- Hospitalization costs covered by HK
HK and global challenges going forward

<table>
<thead>
<tr>
<th>Multi-Country Cooperation &amp; Multilateral Cooperation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 2001 WHA Resolution 54.14 Global Health Security:</td>
</tr>
<tr>
<td>- Global strategy for prevention of movement of communicable diseases across national borders</td>
</tr>
<tr>
<td>- 2005 revised International Health Regulations (IHR)</td>
</tr>
<tr>
<td>- 2014 Global Health Security Agenda (GHSA)</td>
</tr>
</tbody>
</table>

- Monitor domestic & external risks
- Health system capacity if surge
- Normalization
  - Economic & emotional toll
  - Risk of uncontrolled infections
  - Tailor domestic & border measures
- Return of overt social unrest
Lessons from South Korea for COVID-19

Juhwan Oh, MD, MPH, PhD

Seoul National University Hospital
Seoul National University College of Medicine
5 phases based on number of new cases per day

Source: Korea CDC
Confirmed cumulative cases across districts

Source: Korea CDC
South Korea have flattened cumulative epi-curve
**Early Phases Responses**

**Phase 0**
- 0 case period
- Early recognition of the threat *(China Epidemic)*
- Rapid activation of national response protocol

**Phase 1**
- 0-5 new cases per day
- Rapidly establishing wide-spread diagnostic capacity
Phase 2. Rapid System Transformation

Establishing national center for disaster relief led by prime minister with declaration of the highest (4th) level (Red) of epidemic crisis on Feb 23

Treatment System Re-design (Separate two-tier systems)

Critically ill patients (5%)
Severe patients (10-15%)
COVID ONLY hospitals vs Non-COVID hospitals
Mild-to-moderately ill patients (80%)
observation admission center
Triage at initial entry point] all respiratory symptom or fever

Prevention System Re-design

Local contact tracing, Diagnostic test, Isolation
When someone *diagnosed*

**Prevention Action Begins**  
*Initiating contact tracing*

- Testing the contacted persons
- Isolating until result comes (at home)
- Admission to observation centers if positive results

**Treatment Action Starts**  
*Admission to facility*

- Close monitoring even without Sx by CCTV and phone within dormitory via health professionals
- Conservative treatment for those with symptom
Prevention System Re-design

Local contact tracing
by (temporary) district EIS officers
by provincial/central EIS officers

Diagnostic test
Evaluation through local screening/triage centers
at district centers

Isolation
at home or at public isolation dormitory (incoming travelers)

Free food and living stuff were provided for those isolated
Figure 1. Stepwise approach in monitoring contacts when a patient with COVID-19 is detected. GPS = global positioning system.

Short Communication

Contact Transmission of COVID-19 in South Korea: Novel Investigation Techniques for Tracing Contacts

COVID-19 National Emergency Response Center, Epidemiology & Case Management Team, Korea Centers for Disease Control & Prevention *

Korea Centers for Disease Control and Prevention, Cheongju, Korea

ABSTRACT

Article history:
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In the epidemiological investigation of an infectious disease, investigating, classifying, tracking, and managing contacts by identifying the patient's route are important for preventing further transmission of the disease. However, omissions and errors in previous activities can occur when the investigation is performed through only a proxy interview with the patient. To overcome these limitations, methods that can objectively verify the patient’s claims (medical facility records, Global Positioning System, card...
Aggressive Contract Tracing with Test: cum. number of tests per population
**Re-design towards two-tiers systems**

<table>
<thead>
<tr>
<th>COVID Section</th>
<th>Non-COVID Section</th>
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<tbody>
<tr>
<td>University Hospital 1 COVID Section</td>
<td>Non-COVID Section of the same hospital</td>
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<tr>
<td>University Hospital 2 COVID Section</td>
<td>Non-COVID Section of the same hospital</td>
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<td>COVID Hospital 1</td>
<td>Non-COVID Hospital 5</td>
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<td>COVID Hospital 2</td>
<td>Non-COVID Hospital 4</td>
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<td>COVID Hospital 3</td>
<td>Non-COVID Hospital 3</td>
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<td>COVID Hospital 4</td>
<td>Non-COVID Hospital 2</td>
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<tr>
<td>COVID Hospital 5</td>
<td>Non-COVID Hospital 1</td>
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<tr>
<td>Observation center 1</td>
<td>Observation center 8</td>
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<tr>
<td>Observation center 2</td>
<td>Observation center 7</td>
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<tr>
<td>Observation center 3</td>
<td>Non-COVID ambulatory clinic</td>
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<tr>
<td>Observation center 4</td>
<td>Non-COVID ambulatory clinic</td>
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<tr>
<td>Observation center 5</td>
<td>Non-COVID ambulatory clinic</td>
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<tr>
<td>Observation center 6</td>
<td>Non-COVID ambulatory clinic</td>
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<tr>
<td>Observation center 7</td>
<td>Non-COVID ambulatory clinic</td>
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<tr>
<td>Observation center 8</td>
<td>Non-COVID ambulatory clinic</td>
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<tr>
<td>Triage Center</td>
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*Phone call, non-contact registrar first to be properly positioned*
Phase 3-5 Active social distancing encouraged by government for preventing re-surgeing

- (Since March 22) Strong recommendation to minimize non-essential mobility or social gathering
  - Delayed school re-opening from winter break (equivalent to school closure) through online class
  - Discouraged in-person religious worship or indoor gym activities
  - Encourage home-based work
- Exit via stressing quarantine in daily life
- Unlike US or EU, NO banning of most of ordinary businesses such as restaurant, bar
Population Mobility Statistics based on mobile big data (from January to March)

- Publicly provided information by SK Telecom & Korea Statistical Office

Source: HiT News

(March 22) Strong recommendation of social distancing
To prevent rebound of already, voluntarily, reduced population mobility

(March 22) Strong recommendation of social distancing

Source: HiT News
Decreasing number of newly affected cases with unknown origin (orange colored) from 15% to 5% or lower [March 1-31]

(March 22) Strong recommendation of social distancing

Source: HiT News
Universal Health Coverage for COVID

- Medical bill for all COVID-19 related medical cost has been covered by Tax based on legal framework.

100% Out-of-pocket

90-100% Covered by Health Insurance

0-10% Co-payment
Transferable Lessons

• Aggressive technical response in prevention (Public health) & treatment (Medicine)
  • Aggressive *contact-tracing, quarantine (isolation) & testing*
  • Aggressive *triage* based COVID vs non-COVID separation & *closed monitoring for mild cases* & *tireless clinical service for critically ill cases*

• Prompt transformative response by steady government commitment (President-PM office /MoHW /KCDC /Provincial Government/District Health center)

• Trust between citizen/public & government
  • *Transparent risk communication & Public engagement*

• Proactive Health Professionals’ voluntary sacrifice
Responses to COVID-19 outbreak in Taiwan

Chang-Chuan Chan, ScD
Dean, Professor, College of Public Health
National Taiwan University
Confirmed cases of COVID-19 by onset date (Taiwan)

Data source: https://www.cdc.gov.tw/ updated: 2020/04/14
WHO advises against the application of any travel or trade restrictions on China.

Travel notice levels:
1 – Watch; 2 – Alert; 3 – Warning

Level 1 notice for Wuhan
Level 2 notice for Wuhan
Level 3 notice for Wuhan

Restrictions of international traffic are not necessary.

Onboard quarantine for direct flights from Wuhan (12 flights per week)

Level 1 notice for Wuhan
Level 2 notice for Wuhan
Level 3 notice for Wuhan
Ban entry of Wuhan residents

Suspended tours to Wuhan; Hubei Level 3 notice; rest of China Level 2 notice

NIA provide past 14-day Wuhan travel history to integrate into NHIA database

Restrict export of N95 & surgical masks

NIA: National Immigration Administration
NHIA: National Health Insurance Administration

Mask purchase at convenient stores (3 per purchase)

National wide requisition of domestically produced surgical masks

Set up Central Epidemic Command Center (CECC)

Dec 31 Jan 5 Jan 7 Jan 12 Jan 16 Jan 20 Jan 21 Jan 23 Jan 24 Jan 25 Jan 27 Jan 30 Jan 31
Issue guidance on mass gathering and taking care of ill travelers at PoE

Ban cruise ships; Denied entry of all Chinese nationals

Denied entry of foreign nationals w/ travel history to China in past 14 days

Contact tracing for Diamond Princess passengers disembarked in Taiwan

Ban most flights from China

NIA expanded travel history information integrate into NHIA database

Ban overseas travel of healthcare workers

14 day home quarantine for those with travel history to China, HK, Macau, and South Korea

Restrict hospital visits; Local governments ban mass gatherings such as school trips and religious parades.

Matsu pilgrimage parade postponed

Postponed spring semester for universities

Postponed spring semester from elementary to senior high schools

60 mask manufacturing machines installed

(Feb 6) Began name-based rationing system (buy using NHI IDs at pharmacies)

(Adults 2 per week, children 4 per week)
Start online Name-Based Mask Distribution System

Increase purchase limit (adults 3 per week, children 5 per week)

MOE issue notice for university staff and students to postpone all unnecessary overseas exchange

WHO declared COVID-19 a "pandemic"

Level 3 notice for all travelers required for 14 days quarantine

Ban all transfer flights to Taiwan

Recommend cancel mass gatherings of >100 people indoors and >500 outdoors

Issue social distance guidelines: <1m indoors and <1.5m outdoors, otherwise wear a mask

Do not recommend mask wearing for healthy members of the general population

"Epidemic Prevention Transport Service" from airports

Mobile phone-based "electronic fence" uses location-tracking to ensure people under quarantine stay at homes.
WHO

Taiwan

Border Control

Digital Tracing

Social Distancing

Self Protection / Resource Allocation

Launched new SMS function for those in quarantine to report health status

Mandate wearing face masks on public transportations

Issue stricter regulations for home quarantine

All host/hostess clubs and ballrooms to suspend operations

Crowd control imposed at tourist hotspots, night markets, and temples

Online application to send masks to close relatives overseas
Digital tracing – Diamond Princess

- 2694 passengers disembarked in northern Taiwan on Jan 31st
- Used mobile sensor data cross-validated by other big sensor surveillance data to identify 627,386 potential contact persons with mobile geo-positioning method and rapid analysis
- SMS message to citizens who might have contact with the passengers
- National Health Insurance data linked with contact population to follow up hospital visits
- 69 contacts were tested by RT-PCR (all negative)

Courtesy of Dr. Hsien-Ho Lin

Done in 1 day
The Matsu detour
Evolution of Name-Based Mask Distribution System

**Name-Based Mask Distribution System 1.0**

- Time-consuming
- Close contact

*photo by udn.com*

**Name-Based Mask Distribution System 2.0**

*Two-step Mask Reservation Using Mobile Phone:*

1. Login with NHI Card
2. Finish Mobile Device Binding Procedure

- Register the NHI Card is needed for first-time users
- Information needed:
  - Household number (please check the household certificate)
  - Address
  - Phone number, E-mail
  - Setting NHI Card password

*Option 1 QR Code Scan*

1. Log into the registration website using NHI Card
2. Click mobile device verification
3. Produce device verification code

*Option 2 Certification Code Typing*

1. Download NHI Express APP(全民健保行動快易通APP)
2. Click My Health Bank
3. Choose device verification

**National Health Insurance (NHI) IC card**
Did all of these responses work?

<table>
<thead>
<tr>
<th>Taiwan's Total</th>
<th>Tested</th>
<th>Excluded</th>
<th>Confirmed</th>
<th>Died</th>
<th>Recovered</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50,703</td>
<td>47,407</td>
<td>395</td>
<td>6</td>
<td>155</td>
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</table>

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<thead>
<tr>
<th>New from Yesterday</th>
<th>Tested</th>
<th>Excluded</th>
<th>Confirmed</th>
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<tr>
<td></td>
<td>962</td>
<td>1,078</td>
<td>2</td>
</tr>
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</table>

Number of Cases Suspected SARS-CoV-2 Infection Tested - By Reporting Sources

- Enhanced surveillance
- Reported from Home Quarantine
- Reported COVID-19

Update time: 2020-04-16 00:30
Our combined efforts to protect public health

More than 100 technicians from companies across Taiwan volunteered their time, expertise, and resources to assemble 92 surgical face mask production lines in 40 days that boost Taiwan's daily production capacity from 4 million to 15 million.

National Taiwan University College of Public Health hold weekly press conferences to provide scientific details on national and international developments, and recommend containment policies based on scientific findings and data analysis.

Central Epidemic Command Center (CECC) hold daily administrative briefings to inform the public of the current outbreak status, policies, and information on COVID-19.
How did we achieve this?

• Our society as a whole learned harsh lessons from the 2003 SARS outbreak:
  • we should be ready for newly emerging diseases
  • we cannot expect timely and accurate disease outbreak data from China

• Early border control policy is our most important and successful containment measure

• Efforts were significantly enhanced by our advanced information technology, digital communication networks, and big data science

• Clear and effective communication

• Taiwanese people are familiar with the necessary personal measures to avoid infection, very supportive of government’s policies, and have complied faithfully with infection-control measures.

• Taiwan’s single-payer National Health Insurance (NHI) system enables us to mobilize the healthcare resources of the entire country during an outbreak.
We are in the first inning of the ball game

Photo by Central News Agency / April 12, 2020